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We are continuing our studies into short-timescale burst features in solar flares as observed by the BATSE instrument on the CGRO. Personnel involved in this effort include Dr. A.G. Emslie, the Principal Investigator, JOint VEnture (JOVE) faculty member Theodore LaRosa (Kennesaw State College), undergraduate student S. Mehta, and Dr. M.E. Machado, now at CONAE, the Argentine Space Agency.

As discussed in previous reports, we have discovered many instances of rapid (~ 100 ms) fluctuations in Channels 1,2 and 3 of the BATSE instrument for which the time profiles are remarkably similar in all the channels, and are devoid of energy-dependent effects predicted by both thermal and non-thermal models of hard X-ray production in flares. We concluded that the temporal variations in these fast bursts are due to actual variations in the energy input, and not to energy transport effects. Consequently, we have termed these bursts "energy release fragments" (ERF's). Further study of the time profiles, reveals that, taken statistically, their peaks are synchronous to better than a few tens of milliseconds, less than the sampling period in any given event. These findings were reported at the 1994 Baltimore AGU meeting (Emslie, Machado, and Mehta 1994), and a journal paper based on these results is presently in preparation.

The Japanese YOHKOH spacecraft has observed (Masuda *et al.* 1994, *Nature*, in press) an interesting event in which a hard X-ray source is observed *above* the soft X-ray loop. They interpret these observations as evidence for a classic X-type neutral point reconnection (e.g., Kopp-Pneuman model). We have analyzed the hard X-ray time profiles both from this "apex" region and from the loop footpoint regions that are also seen. We find evidence for energy-dependent delays that are consistent with energy transport effects associated with the propagation of a thick-target electron beam. Further analysis of this event should enable us to place constraints on the pitch angle distribution of the injected electrons and on the temporal profile of the injected electron flux.

A major goal of the next period is to integrate these various results into a model for particle acceleration in flares. Dr. James Miller (currently at USRA, assigned to Goddard Space Flight Center) will take up a faculty position at UAH in August, and we anticipate that his expertise in particle acceleration physics will provide a major impetus to this effort.